

10-18-72 3794' PBTD Preparing to break circulation and squeeze 5-1/2" casing.

Layed down bit and scrapper. Had to flare out top of 5-1/2" casing. Ran Gamma Ray - Neutron and Casing Collar Log from 3550' to 3100'. Set WASP bridge plug at 3800' with 1 sack of cement on top to 3794'. Tested casing and bridge plug to 1400 PSI, Held OK. Ran block squeeze gun and perforated at 3695'. Started hydrotesting tubing in hole. Unable to do so because of scale - Shut In due to darkness.

10-19-72 3794' PBTD Preparing to break circ. and squeeze 5-1/2" casing to surface.

Unable to hydrotest tubing because of scale. Layed down tubing and picked up new string. Tested in hole to 3516'. Set packer and pumped into formation at 3695'. Would not circ. Pumped 50 sacks 1-1 Pozmix, 8% gel and overflushed 3-1/2 bbls. Shut In with 800 PSI on tubing.

Max. Pressure	=	1850 PSI
Max. Inj. Rate	=	3 BPM
Immed. S.I.	=	1200 PSI
15 Min. S.I.	=	800 PSI

Shut in overnight.

10-20-72 3794' PBTD Preparing to perforate and squeeze cement to surface from 3000'.

Tried to break circ. from 3695'. Unable to do so. Squeezed 100 sacks 1-1 Pozmix, 8% gel in formation and left 45' in pipe. Shut In with 800 PSI on tubing.

Max. Pressure	=	1850 PSI
Max. Inj. Rate	=	3-3/4BPM
Immed. S.I.	=	1250 PSI
15 Min. S.I.	=	850 PSI

Shut in overnight.

10-21-72 3794' PBTD Pressure testing Squeeze No. 2.

Pressure tested Squeeze No. 2. Would Not Hold. Pumped 90 bbls. salt water and 10 bbls. fresh water into perforations at 3695'. Followed by 50 sacks regular cement with 2% chl. Left 50' of cement in pipe. Shut In under pressure to wait on cement.

Max. Pressure	=	1800 PSI
Max. Inj. Rate	=	4 BPM
Immed. S.I.	=	1200 PSI
15 Min. S.I.	=	1000 PSI

10-22-72

3794' PBTB Pressure testing Squeeze No. 3.

Pressure tested squeeze. Would not hold. Pumped in 1-1/2 bbls. at 400 PSI. Pulled out of hole with tubing and packer. Ran Baker drillable cement retainer on 2-7/8" tubing. Set at 3635'. Squeeze No. 4 Pumped 50 sacks 1-1 Pozmix with 2% ChCl. Cleared tool and pulled out of hole. Max. Injection Rate 2-1/2 BPM. Max. Injection Pressure 2000 PSI. Immediate S.I. 1500 PSI. 3 Min. S.I. 1100 PSI.

Ran 4 way block squeeze gun on Wireline and perforated at 3000'. Run in hole with Retrieve-O-Matic packer and set at 2713'. Pumped into formation at the rate of 4 BPM - 1800 PSI. Unable to circ. to surface. Pumped 310 sacks of 1-1 Pozmix (150 sacks 8% 160 sacks 2%) and 100 sacks regular cement with 2% ChCl. Cleared tool of cement and started to stage same. 1 bbl. at 20 min. intervals for a total of 5 bbls.. Max. Rate 2-1/2 BPM Max. Pressure 1900 PSI S.I. Tubing with 1400 PSI. 30 Min. S.I. 1350 PSI. Shut down for darkness and WOC.

10-23-72

3795' PBTB Preparing to perforate and water frac the Dakota.

Hooked up portable pump and pressure tested squeeze # 4 down tubing with 1000 PSI. Pressure bled down 300 PSI in 26 mins.. Released packer and pulled out of hole. Ran 5-1/2" casing scraper and 4-3/4" bit to 2991'. Tagged cement. Drilled 10' of hard cement and 50' of cement stringers. Ran tubing to top of cement retainer at 3635'. Found 20' of fillup on retainer at 3615'. Pulled out of hole with bit and scraper. Ran Cement Bond Log. Ragged bond 2840' to 3060', excellent bond 3060' to 3080', and 3110' to 3155'. Ragged bond 3155' to 3500'. Run in hole with Retrieve-O-Matic packer to 3330'. Shut in for darkness.

10-24-72

3795' PBTB Waiting on equipment to complete pumping station. 20 PSI on tubing this A.M.

Perforated Dakota formation with 1-11/16" thru tubing gun, 4 holes per foot at three intervals, 3195-3255', 3335-3400', and 3430-3445' (3 runs). Pumped 200 BW into formation after each run. Set packer at 3114' and fraced entire Dakota formation with 200 Bbls. salt water. Dropped ball sealers and pumped 410 BW with no increase in pressure. Estimated rates and pressures are as follows with 390 BW.

Rate @ 6 BPM	=	1500 PSI	=	8,640 BPD
Rate @ 8 BPM	=	1950 PSI	=	11,520 BPD
Rate @ 10 BPM	=	2300 PSI	=	14,400 BPD
Rate @ 11 1/2 BPM	=	2400 PSI	=	16,560 BPD

Well flowed 1/2" stream of salt water after perforation of first interval and increased to 3" flow at end of job. Pulled out of hole with tubing and packer. Installed well head. Shut in well and rigged down pulling unit. Total salt water used on frac job = 1400 bbls.
TO DROP FROM REPORT.

C. H. MURPHY, JR., ET AL

EAST POPLAR UNIT NO. 3

LOCATION: C NW SE Section 10, Township 28North, Range 51East,
Roosevelt County, Montana

ELEVATION: 2094' K.B.

SPUDED: August 1, 1952

COMPLETED: September 5, 1952

TOTAL DEPTH: 5788' Dril., 5785' Schlumberger Microlog, 5783.5 Lane-Weils,
5783' Schlumberger ES.

HISTORY

August 1 Spudded, and drilled to 107' with a 12 1/2" bit.

August 2-4 Repairing rig.

August 5 Drilled 107' to 970'. 970=969 SLM

August 6 Set 947.69' of 9-5/8" casing at 960.47' with 390 sacks cement
and 4 sacks calcium chloride. W. O. C.

August 7 W. O. C. Drilled out cement and plug, and drilled to 1036' with
8-3/4" rock bit.

August 8-25 Drilled 1036' to 5595'. 5595=98 SLM

August 26 Cut Core No. 1, 5598-5633, with 7-7/8" diamond bit. Drilled 5633-79'
with 7-7/8" rock bit.

August 27 Drilled 5679-5750'.

August 28 Cut Core No. 2, 5750-88', with 7-7/8" diamond bit. Ran Schlumberger
ES and Microlog.

August 29-
September 5 Well completed as set forth under "completion data".

EAST POPLAR UNIT NO. 8

COMPLETION DATA

Ran 181 (5765.65') joints of 5-1/2", 15.5#, J-55 casing which was landed 12.70' below R.K.B.; scratchers at 5597 to 5602, 5607-12, 5624-29, 5642-52, 5752-62, 5768-73; centralizers at 5605, 5656, 5765; float collar at 5743.96; shoe at 5778.35 drlr. Cemented with 250 sacks common Dakota bulk cement and 5 sacks gal. Pumped plug with 1200#; released pressure, held O.K. Plug down 6:00 P.M., 8-29-52. W.O.C. for 48 hours.

Ran Lane-Weils Gamma Ray-Neutron log to check measurements and shoot from Perforated 5614-23 (B-1) and 5630-36 (B-2) with 4 jet shots per foot. Went in hole with open hole jet gun to perforate bottom 10' of open hole. The gun failed to fire and was lost at 4000' while coming out of hole. Pushed gun to bottom with bit and casing scraper on tubing; drilled and cleaned out to TD. Re-ran open hole gun and perforated 5782-86 (driller). Ran Baker wire line junk basket, then started in hole with Baker Model "D" Packer which set prematurely at 695'. Drilled out packer and cleaned out to bottom.

Set Baker Model "D" Packer with wire line at 5755'. Ran 187 joints 2-3/8" O.D. 4.70#, J-55, 8rd. thrd. Japanese tubing and subs (5767.99'). Landed 11.30' below R.B.

1 Jt. Tbg.	31.21
1 Sub	4.03
1 Sub	6.11
1 Sub	10.10
186 Joints Tubing	5,689.13
1 Otis Model "T" Ck.	1.34
1 Baker Tealer Sub	.58
2 Baker Seal Nip.	2.00
2 Pc. Blank Flush Jt.	12.42
1 Perf. Nip.	5.00
1 Baker Seal Nip.	.83
1 Blank Flush Jt.	5.24
	<hr/> 5,767.99
Below R.B.	11.30
	<hr/> 5,779.29

Acidized "B" Zone with 1000 gal. Formation broke down with 1800# pressure. Pressure dropped to 1400#. Injected acid into formation with 1400# at rate of 2-1/4 bbls. per minute.

Acidized "C" Zone with 500 gal. Formation broke down with 800# pressure. Pressure dropped to 700# while injecting acid. Injected acid at rate of 2-1/4 bbls. per minute.

Both zones flowing through one flow line; turned into tanks at 8:45 P.M. 8-5-52. Well produced 254.72 B.O. in 11 hours.

"C" Zone - 8/64" choke TPF 550#
"E" Zone - 9/64" choke CPF 650#

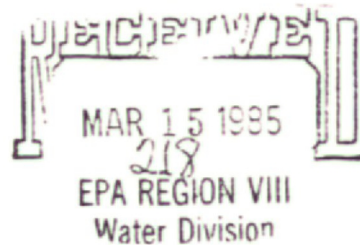
Released rig at 7:00 A.M. 8-6-52.



200 PEACH STREET
EL DORADO, ARKANSAS 71730

March 14, 1985

*Received in Drinking
Water Branch
3/15/85
8-D*



Mr. Max H. Dodson, Director
Water Management Division
United States Environmental
Protection Agency, Region VIII
1860 Lincoln Street
Denver, Colorado 80295-0699

Re: Underground Injection Control
(UIC) Permit Application for:
East Poplar Field Well Nos. 1-D,
5-D, 8-D, 29-D, & 80-D.
Ref: 8WM-DW

Dear Mr. Dodson:

This is in response to your certified letter dated with Attachments I, II, and III, all pertaining to the referenced applications, which we received on March 5, 1985. We believe the attached adequately answer questions or make corrections as such were listed on your attachments.

Murphy Oil USA, Inc. is very much aware of the seriousness of the permit applications and have worked diligently to make the applications complete. We have operated in the East Poplar Field for more than 30 years and hopefully will be operating there for many years to come. We plan to do whatever is required to comply with the regulations of the Environmental Protection Agency, as we have with all of the Federal and State Agency, as we have with all of the Federal agencies which we have worked with over the years.

The help and cooperation of your staff is very much appreciated in this permitting process. Please contact the undersigned or Mr. Sidney W. Campbell at 501-862-6411 if you have any further questions.

Yours very truly,

Alvin W. Simpson
Manager of Operations

AWS/cs
Attachments
cc: Ray Reede
Poplar, MT



8-0

ANSWERS TO ATTACHMENT I
COMMON DEFICIENCIES

- 1) Attached is a list of names and addresses with U.S. Postal Service Certified Numbers for each addressee along with a copy of the notice sent to each owner or tenant within one-half mile of the proposed permitted well.
- 2) A copy of the most recent topographical map for each well is attached and the subject well for each is highlighted.
- 3) The corrosion inhibitor used in the East Poplar Unit disposal wells is a Nalco 3900 fluid with Nalco 4300 scale inhibitor and Nalco 3410 for corrosion inhibition.
- 4) There are no cement bond logs available on these wells. Good circulation to the surface was attained during cementing on each completion or recompletion which we are currently using; therefore, no cement bond logs were run. Tracer survey's have been run on the present injection zones and a copy of each survey is attached.
- 5) There are no other EPA permits on the East Poplar Unit.
- 6) The estimated plugging and abandonment costs have been revised and a new Form 7520-14 for each well is submitted with this letter. Changes have been made to reflect the required 50 foot minimum plug length. All of the plugging costs are estimated to be the same and itemized as follows;

Rig Services	\$7,500
Cementing Services	\$6,500
Wireline Services	\$6,000
Cleanup	\$3,000
Miscellaneous Expenses	<u>\$2,000</u>
Total	\$25,000

- 7) A bond is being provided. This is in the form that was discussed and agreed to by Mr. Melvin O. Colvin and Mr. F. T. Rieby over the telephone.

8-D

ANSWERS TO ATTACHMENT II
DEFICIENCIES FOR EPU WELLS 1-D, 5-D, and 8-D

(Continued)

- E) A new Form 7520-14 is attached. Also, a completion and workover history is attached.

3) EPU 8-D

- A) Correction to Form 4, Item XI has been noted on our form. The letters should be "A, E, G, H, M, Q, R, and U" and not "..R to U". Please note the correction on your form.
- B) The discrepancy between the Sundry Notices and Attachment G is noted. However, the Sundry Notice to which you refer was for squeeze cementing when the No. 8-D Well was completed into the Judith River Sand. The perforations from 990'-991' were below the Judith River in order to get cement coverage across the zone to be perforated for injection. A completion and workover history is attached.
- C) Well No. 19 (760' FSL and 1980' FEL of Sec. 19, T29N, R51E) and Well No. 4-G (same location description) are not the same well. No. 19 is a Madison producer and No. 4-G was originally a Judith River gas well. The 4-G was drilled at the same time as the No. 19 well by moving the Rotary Table approximately 5' away from the No. 19 wellbore. The 4-G was a Judith River gas well. No. 4-G was converted to and is currently used as a water source well for production operations. Saltwater Disposal Station No. 1 is at EPU 1-D, Saltwater Disposal Station No. 3 is at EPU 80-D and Saltwater Disposal Station No. 4 is at EPU 8-D. Saltwater Disposal Stations are shown on the topographical map attached to the common deficiencies submittal. Also attached are additional water samples from the Judith River.
- D) The cement used will be Class G or equivalent quality cement. A new Form 7520-14 is attached.

ANSWERS TO ATTACHMENT II
DEFICIENCIES FOR EPU WELLS 1-D, 5-D, and 8-D

1) EPU 1-D

- A) The Judith River top based on logs from EPU Well No. 31 is at approximately 680 feet below RKB. See attached copy of Electric Log for EPU No. 31. The formation at approximately 1000 feet in the 1-D is probably the Eagle Formation. The Eagle is a gray silty shale with a tract to larger amounts of limy sandstone. See attached description of drill cuttings from EPU No. 1. The water quality of the Eagle Formation has not been tested in the East Poplar Field. A review of our records does not indicate any "water bearing" sand at this depth.
- B) We have two pumps which operate at Salt Water Station 1-D. They have different injection rates and do not operate simultaneously on a regular basis. The hours of operation is the total average hours of operation. The injection rate of 270 Bbls./hour is for the primary pump and the average injection volume is the approximate daily average for a period of three to four months.
- C) The December submittal is correct. EPU #78 is temporarily abandoned. The pumping equipment and sucker rods have been removed. The tubing is still in the well and it is shut-in at the surface.
- D) Plug and Abandonment Form 7520-14 has been revised and is attached.
- E) The values of Casing/Tubing depth are in feet (i.e. 165.61 feet). The sacks of cement of Class G, 1-1 Pozmix of Pozmix cement is the volume of cement used to set the casing. The 13 3/8", 9 5/8", and 7" were run in the original open hole at the depths indicated. The 5 1/2" was run as a liner to repair leaks in the 7" casing. A completion and workover history is attached.

2) EPU 5-D

- A) The depth of the Tertiary sand is approximately 86 feet as reported on Form 7520-10.
- B) EPU No. 107 is producing from the Madison "B" Zone. There is no cement bond log for Well No. 107. No mechanical integrity test has been run because there has been no indications of casing leaks in the well.
- C) There are two pumps at Salt Water Station No. 5. Refer to response of question 1)B. of this section.
- D) The correction has been made to Attachment M and is attached (38# has been changed to 48#).

RECORD OF COMMUNICATION

☒ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE
☐ OTHER (SPECIFY)

(Record of item checked above)

TO:

Pasquale Laborda
BLM

FROM:

Laura Clemmens

DATE

4/16/85

TIME

3:45

SUBJECT

Workover Plans for Grace Wells

SUMMARY OF COMMUNICATION

Told Pasquale that I had approved
Grace's well repair plans, and was
sending him a copy of my letter
to Jack Nance. I also mentioned
that we didn't permit the Buck Elk,
injecting into the Judith River. He
said that two men in his office
would appreciate being notified
of any Judith River hearings:

Ray Brubaker } 585-5011 (FIS operator)
Jim Murkin } 232-4331

CONCLUSIONS, ACTION TAKEN OR REQUIRED

BLM Miles City Office
Division of Mineral Resources
P.O. Box 940
Miles City, MT 59301

INFORMATION COPIES

TO:

EPU FILE, GOINGS FILE, LUIZZI (JUDITH RIVER), EHLERT



200 PEACH STREET
EL DORADO, ARKANSAS 71730

March 8, 1985

Address List Attached

Dear Owner or Tenant:

As required by 40 CFR Section 147.1355 you are hereby notified that Murphy Oil USA, Inc., 200 Peach Street, El Dorado, Arkansas 71730 has applied for an EPA Form 4 Permit and plans to inject produced formation water which is associated with oil producing operations. The following describes the zone and location for which a permit has been applied for.

Well Name: East Poplar Unit 8-D
Well Location: 1980' FEL and 1980' FSL, Section 10,
T28N-R51E
Injection Zone: (a) Name: Judith River
(b) Depth: 830' to 880'
Injection Pressure: (Maximum) 700 psig
Injection Volume: (Daily Rate) 7100 Barrels
Injection Fluid: Mississippian (Madison & Heath) Water

@1985 Injection
data
inj zone 830-880
@700 psi

Mr. William Engle of the EPA Montana Operations Office in Billings may be contacted if you have any questions concerning the submitted permit application. You will be given the opportunity to comment following an announcement by the EPA after they have prepared a draft permit.

Yours very truly,

Alvin W. Simpson
Manager of Operations

AWS/kw

Attachment

VIA: Certified Mail



SURFACE OWNERS AND/OR SURFACE LESSEES
ROOSEVELT COUNTY, MONTANA
March 7, 1985

#8-D

Township 28 North, Range 51 East

Owners and Lessees

Certified Mail Number

Audrey B. Kirn (Lessee)
Box 884
Poplar, MT 59255

P 078 582 181 ✓

Birdie Sanchez
1000 South 130th
Seattle, WA 98146

P 078 582 182

Zimmerman, Inc., A Montana Corp.
Box 277
Poplar, MT 59255

P 078 582 183 ✓

Michael Kirn (Lessee)
Box 884
Poplar, MT 59255

P 078 582 184 ✓

Earl W. Baker
Box 56
Poplar, MT 59255

P 078 582 185

Audrey M. Buckles
Box 252
Poplar, MT 59255

P 078 582 186 ✓

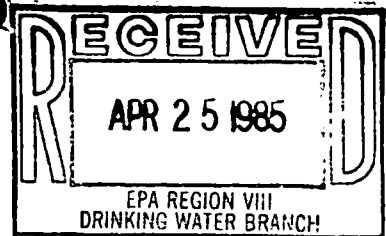
Fort Peck Tribes
Assiniboine/Sioux
Box 1027
Poplar, MT 59255

P 078 582 187 ✓

1985 List
Simpson
Carter

MURPHY
OIL USA, INC.

300 PEACH STREET
EL DORADO, ARKANSAS 71730



- 1) 862-6411
- 254 (Auto 3M 9165)
- 596 (Confirm)
- 270 (Mailroom)

TELECOPY COVER PAGE

TO: 4-24-85
EPA Region 8
(Company)

TIME: 4:05
Conover CO
(City, State)

ATTENTION:

Mike Murphy

TELECOPY
NUMBER: 910-931-2215

VERIFICATION
NUMBER: _____

FROM:

Sidney Campbell
(Person's Name and Department)

PAGES SENT: 7 (Includes Cover Page) OPERATORS NAME: Lisa

VERIFIED:

(Date, Time & Initials)

TELECOPY



200 PEACH STREET
EL DORADO, ARKANSAS 71730

April 24, 1985

Mr. Mike Liuzzi
EPA Region 8
1860 Lincoln Street
Denver, Colorado 80295-0699

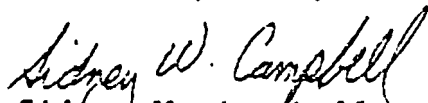
EPU Tracer Survey Interpretations

Dear Mr. Liuzzi:

Transmitted along with this letter is one copy each of interpretations for the five EPU Tracer Survey's submitted with permit applications. The interpretations were furnished to us by Mr. Cliff Binks with Gearhart in Williston, North Dakota.

Please contact me if you have any further questions concerning these interpretations. Also, you may want to contact Gearhart in Williston or in Denver. The contact in Denver with Gearhart is Mr. Glen Horrie.

Yours very truly,


Sidney W. Campbell
Sr. Petroleum Engineer

SWC/ac





GEARHART INDUSTRIES, INC.

SUBJECT: MURPHY OIL USA INC.

E.P.U. 4-D

AKA 8-D

EAST POPLAR UNIT

ROOSEVELT CO. MT

10-28N-51E

VELOCITY SHOTS #1 AND #5 INDICATE NO FLUID MOVEMENT OUT THE TAILPIPE AND BACK UP. VELOCITY SHOTS #2 AND #3 INDICATE MAJORITY OF FLUID BEING LOST BETWEEN 830-840, VERY LITTLE BEING LOST BETWEEN 840-860, THE REMAINING PORTION OF THE FLUID BEING LOST BETWEEN 860-880.

ALL OF THE ABOVE INTERPRETATIONS APPLY ONLY TO THE WELL CONDITIONS AT THE TIME THAT THE SURVEYS WERE TAKEN.



200 PEACH STREET
EL DORADO, ARKANSAS 71730

*Received in Drinking
Water Branch
4/4/85*

April 2, 1985

Mr. Angus Campbell
Environmental Protection Agency
Region VIII
1860 Lincoln Street
Denver, Colorado 80295-0699

East Poplar Unit
Tracer Survey's -
Final Print

Dear Mr. Campbell:

Enclosed is one final print of each tracer survey run on the East Poplar Unit disposal wells; well numbers 1-D, 5-D, 8-D, 29-D, and 80-D. These final prints are to replace the field prints included in the latest response.

Yours very truly,

Sidney W. Campbell
Sidney W. Campbell
Sr. Petroleum Engineer

SWC/ac
cc: Ray Reede
Poplar, Montana

